

REMARKS/ARGUMENTS

Claims 7, 9 and 13, 15 and 16 are pending and have been rejected.
Claim 7 has been amended to clarify the claim only with no change in scope intended.

THE §112 WRITTEN DESCRIPTION REJECTION

Claims 15 and 16 have been rejected under 35 U.S.C. §112 first paragraph for failing to comply with the written description requirement.

The Office Action states:

"There is not basis, in the originally filed specification, for the newly recited 'non-self emulsifying prepolymer' regarding the polyurethane of the instant claims 15-16. This negative limitation, which effectively excludes self emulsifying prepolymers, is not supported per Ex parte Graselli, 231 USPQ 393-395. It is noted further that the described invention encompasses the use of polyether based polyurethane prepolymers which would in fact be self emulsifiable further showing that the instant invention did not intend to exclude self emulsifiable polyurethanes."

Applicants respectfully disagree for the following reasons. The Office Action contends, by citing *Graselli*, that the introduction of non-emulsifying is a negative limitation that does not satisfy the §112, first paragraph written description requirement. However, in *Graselli*, the issue was the introduction of "in the absence" of a particular element into the claims directed to a catalyst. The reasoning of the Board that this was not supported by the written description was that it "implies the permissible inclusion of all other elements not so expressly excluded. This clearly illustrates that such negative limitations do, in fact, introduce new concepts." *Graselli*

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at 393. In other words, it is not any negative limitation per se that fails to meet the written description, but that it implies that all the other elements are permissively included in the catalyst, which was not supported by the specification's written description.

In contrast, Applicants describe at page 8, lines 16 and 17, " If the prepolymer is self-emulsifying by inclusion of emulsifying non-ionic, cationic, or anionic groups, then an external surfactant may or may not be necessary." Thus, it is clear that the present application contemplates both self emulsifying polyurethane prepolymers with and without an external surfactant and not self emulsifying (non-self emulsifying) prepolymers with an external surfactant, which describes the entire genus of polyurethane prepolymers (i.e., those that are self emulsifying and those that are not). In other words, the limitation to "non-self emulsifying prepolymer," in claim 15 is in no way akin to the situation of *Graselli*, but is a positive recitation of the required subgenus prepolymer (non-self emulsifying). This is more similar to the situation in MPEP 2163.05 (II) (citing *Ex parte Sorenson* 3 USPQ2d 1462 (Bd. Pat. App. & Inter. 1987)) where a subgenus claim, not literally described, of a genus was deemed to meet the written description requirement merely because a species of the subgenus was disclosed. For this reason claims 15 and 16 meet the written description requirement and Applicants respectfully, request withdrawal of this rejection.

In support of the §112 written description rejection, the Office Action contends "that the described invention encompasses the use of polyether based polyurethane prepolymers which would in fact be self emulsifiable further showing that the instant invention did not intend to exclude self emulsifiable polyurethanes." Applicants point out, the requirement for a §112 written description rejection is not based on the intent of an applicant upon filing, but whether a person skilled in the art would recognize "in an applicant's disclosure a description of the invention defined by the claims." (MPEP 2163.04) If the requirement was merely the intent of an applicant, any narrowing claim not contained literally would meet the Office Action's interpretation of the written description requirement. That is, it would never be an applicant's intent, at the time of filing, to have a patent issue with a narrower claim.

Consequently, whether there was any intent to exclude self-emulsifiable prepolymers is irrelevant to the written requirement rejection.

Nevertheless, Applicants will treat this as an argument by the Office Action to support the contention that one of ordinary skill in the art would not recognize in the disclosure a description of the invention defined by claims 15 and 16. To reiterate, it is clear that self emulsifiable and non-self emulsifiable prepolymers are contemplated and readily recognized as described above. However, even if one ignores this, the Office Action's contention that polyether based polyurethane prepolymers are self emulsifiable is erroneous and Applicants do in fact describe species of non-emulsifiable polyurethane prepolymers.

Dispersions of polyurethanes that are self emulsifiable require chemically incorporated hydrophilic centers of the otherwise hydrophobic elastomers. (col. 1, lines 13-16 and col. 2, lines 34-36 of Noll et al. U.S. Pat. No. 4,092,286). For the polyurethane to be emulsifiable "either ionic . . . or lateral or terminal hydrophilic ethylene oxide units are chemically incorporated into the polyurethane-urea." (col. 9, lines 62-65 of Markusch et al. U.S. Pat. No. 4,879,322 and also see Noll, col. 1, lines 38-42 and Coogan et al. U.S. Pat. No. 4,992,507, col. 1, lines 22-25 and 58-68).

Example 1 of the present invention used a prepolymer of poly(propylene oxide) polyol and a 50:50 mixture of 4,4-diisocyanatodiphenylmethane and 2,4'- diisocyanatodiphenylmethane. The prepolymer was chain extended with piperazine. That is, Example 1, used a polyether polyol with only hydrophobic propylene oxide units and no hydrophilic ethylene oxide units and, as such, one of ordinary skill would recognize immediately that this polyurethane is not self emulsifiable and is a species of the sub-genus of non-self emulsifiable prepolymers required in claim 15. Example 1 coupled with the discussion above leaves no doubt that Applicants describe the subgenus of non-self emulsifying polyurethanes as per previously cited MPEP 2163.05 (II) and as such one of ordinary skill in the art would immediately recognize that Applicants were in possession of the invention as defined in claims 15 and 16. Consequently, Applicants respectfully request withdrawal of the §112 written description rejection.

THE §102/103 REJECTIONS

Rejections Relying on Noll and Noll in view of Blake

Claims 7, 9 and 13 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 4,092,286 Noll et al (Noll). Claims 7, 9 and 13 have been rejected under 35 U.S.C. §103 as being obvious over Noll in view of U.S. Pat. No. 4,507,426 Blake.

The Office Action's essential argument for both the §102(b) and §103 rejections is that "[t]he hydrophilic stabilizing groups within the polyurethanes of Noll are not excluded by the instant claims which do not recite much about the polyurethane per se." Claim 7 has now been amended to positively recite that "the latex is *solely* stabilized by a surfactant consisting of an external surfactant." (emphasis added). From this, it is clear that the self-emulsifying polyurethane dispersions of Noll are excluded and as such claims 7, 9 and 13 are novel. Likewise, Noll, regardless of what Blake describes (i.e., emulsifiers), fails to suggest or give any expectation of success to make the claim 7 compositions solely stabilized with an external anionic surfactant. Further, it was well known at the time that externally stabilized systems suffered from the disadvantage of larger particle size "such that the lattices may undergo irreversible sedimentation in storage." (col. 1, lines 18-20 of Noll U.S. Pat. No. 3,905,929, which has the same assignee and inventor as Noll herein). Thus, as amended, claim 7 and claims dependent therefrom are novel and non-obvious over Noll or Noll in view of Blake.

Rejections Relying on Duan

Claims 7, 13, 15 and 16 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 5,900,457 Duan et al. (Duan). Claims 15 and 16 have been rejected under 35 U.S.C. §102(b) as being anticipated by Duan. Claims 7, 13, 15 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Duan.

The essential argument of the Office Action is that "Duan discloses the instantly claimed compositions at column 2, lines 28-62; column 3, lines 13-67, 43231C

column 4, lines 1-67, particularly lines 1 [sic], which shows self emulsifying moieties to not be required, 19-20 and 43-49; column 5, lines 1-67, particularly 1,6 22-26 and 52-67." Applicants respectfully disagree and respond as follows.

In the cites to column 2 and 3, Duan describes generic laundry lists that are useful to make polyurethanes and the use of a particular isocyanate (e.g., norbornane diisocyanate). In columns 2 and 3, however, no mention of any external or internal surfactant is made. At the particular cite, column 3, lines 56-67, a laundry list of polyols is given, with no distinction as to whether they contain hydrophilic centers to make self-emulsifiable polyurethanes, except that the two cites to particular polyols, U.S. Pat. No. 5,610,232 and 4,046,729, are specifically directed to polyols that create self-emulsifiable polyurethane prepolymers.

The Office Action, to bolster the contention that Duan describes and uses dispersions that are not self-emulsifiable, then cites Duan, at col. 4, lines 1-4, "[i]f desired, dihydroxyl alkanolic acids may be used in the preparation of the dispersions described in the present invention." Since, Duan already in the previous cite in column 3, describes other polyols containing hydrophilic centers for making self-emulsifiable polyurethane prepolymers, this cite just reinforces that Duan contemplates the use of the most common ionic hydrophilic centers when making his polyurethane dispersion (e.g., 2,2-dimethylolpropanoic acid, also referred to as dimethylol propionic acid and DMPA, see attached). Thus, Duan to this point, has only described self emulsifiable polyurethane prepolymers.

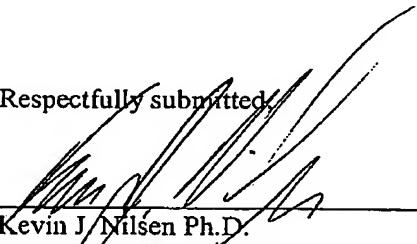
Most telling as to what Duan actually teaches is that when describing making the dispersion (col. 4, lines 43-67), Duan is utterly silent about using an external surfactant to make the dispersion. Further, in the very next paragraph as cited by the Office Action, Duan states, [i]f desired, external emulsifying agents which are free of active hydrogen atoms can be used to *enhance* the isocyanate-terminated polyurethane prepolymer water dispersability or film forming characteristics." (col. 5, lines 1-4, emphasis added). As to the "dispersability", Duan states, "surfactants can be used to *enhance* the prepolymers' dispersability in water." (col. 5, lines 6 and 7, emphasis added). Since enhance means "improve, intensify, increase," the use of an

external surfactant is not necessary to create the polyurethane dispersion (i.e., the polyurethane dispersion is self-emulsifiable), but only improves the dispersability or emulsification. (See page 413, Webster's Ninth New Collegiate Dictionary, Merriam-Webster Inc., Springfield, MA, 1989, attached). Further, because Duan makes absolutely no distinction between the surfactant being added before or after the prepolymer is dispersed, it is clear that Duan only describes, suggests or teaches self-emulsifiable prepolymers. (col. 5, lines 8-10). This is no different than what Noll has taught, which is, self emulsified polyurethane dispersions may include external surfactants to improve some properties of a self-emulsifiable dispersion.

Similarly, with regard to film formation, Duan states, "[a]dditionally, surfactants can be used to *enhance* the final dispersion's film forming characteristics." (col. 5, lines, 12-13, emphasis added). That is, you can not enhance a dispersion's film forming if it is not a dispersion to begin with. In other words, Duan only describes external surfactants being used to improve some property of a self-emulsified polyurethane dispersion. Finally, Duan's examples only use prepolymers incorporating DMPA to make the dispersions without any addition of an external surfactant. Since Duan fails to describe or suggest anything but self-emulsifiable polyurethane dispersions, for the same reason claims 7, 9, 13, 15 and 16 are novel and non-obvious over Noll, they are novel and non-obvious over Duan.

Considering the foregoing reasons, Claims 7, 9, 13, 15 and 16 are patentable. Applicants, therefore, respectfully request withdrawal of all rejections and allowance of Claims 7, 9, 13, 15 and 16.

Respectfully submitted,


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ACPA

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Propionic Acid

Isobutyl Anhydride

Isobutyl Peroxides

Isobutyl Peroxide

Isobutyl Anhydride

Isobutyl Anhydride

Detergent Chemicals

Minerals

Others

DMPA

Dimethylol Propionic Acid

 $C_5H_{10}O_4$

General Information:

CAS: 4767-03-7

UN number: -

TSCA: Listed

ADR Classification: -

EINECS: 2253063

Packaging group: -

HS Code: 2915.50.1000

Specifications:

Appearance: White to Off White crystalline powder

Content: 99.0% min.

Melting point: 188 - 191 °C

Hydroxyl content: 24.6 % min.

Water Insoluble: 0,15%.

Colour APHA: 200

Moisture (K.F): 0.3% max

Packaging: 25 KG bags nett

Applications:

- Waterborne polyurethanes (PUD: polyurethane dispersion)
- Waterborne polyesters
- Waterborne epoxy resins
- Coatings
- Adhesives

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